Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

2006 MDEQ-FEMA Hinds County Lidar Survey

1.2. Summary description of the data:

This metadata record describes the acquisition and processing of bare earth lidar data, raw point cloud lidar

data, lidar intensity data, and floodmap breaklines consisting of a total of 203 sheets for Hinds County, MS.

The post-spacing for this project is 4-meter. This project was tasked by Mississippi Geographic Information,

LLC (MGI); Work Order No. ED-6. EarthData International, Inc. is a member of MGI and was authorized to undertake

this project in accordance with the terms and conditions of the Professional Services Agreement between MGI and

the Mississippi Department of Environmental Quality (MDEQ), dated February 17, 2004, and in accordance with

MGI Task Order No. 18a.

Original contact information:

Contact Name: Becky Jordan

Contact Org: EarthData International, Inc.

Title: Project Manager

Phone: 301-948-8550 x121

Email: bjordan@earthdata.com

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:
2006-04-11 to 2006-04-12

1.5. Actual or planned geographic coverage of the data:
W: -90.728886, E: -90.066405, N: 32.564414, S: 32.048026

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:
NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:
coastal.info@noaa.gov

2.5. Phone number:
(843) 740-1202

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

3.2. Title:
Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Process Steps:

- 2006-12-18 00:00:00 - EarthData has developed a unique method for processing lidar data to identify and remove elevation points falling on vegetation, buildings, and other aboveground structures. The algorithms for filtering data were utilized within EarthData's proprietary software and commercial software written by TerraSolid. This software suite of tools provides efficient processing for small to large-scale, projects and has been incorporated into ISO 9001 compliant production work flows. The following is a 1. The technician performs calibrations on the data set. 2. The technician performed a visual inspection of the data to verify that the flight lines overlap correctly. The technician also verified that there were no voids, and that the data covered the project limits. The technician then selected a series of areas from the data set and inspected them where adjacent flight lines overlapped. These overlapping areas were merged and a process which utilizes 3-D Analyst and EarthData's proprietary software was run to detect and color code the differences in elevation values and profiles. The technician reviewed these plots and located the areas that contained systematic errors or distortions that were introduced by the lidar sensor. 3. Systematic distortions highlighted in step 2 were removed and the data was re-inspected. Corrections and adjustments can involve the application of angular deflection or compensation for curvature of the ground surface that can be introduced by crossing from one type of land cover to another. 4. The lidar data for each flight line was trimmed in batch for the removal of the overlap areas between flight lines. The data was checked against a control network to ensure that vertical requirements were maintained. Conversion to the client-specified datum and projections were then completed. The lidar flight line data sets were then segmented into adjoining tiles for batch processing and data management. 5. The initial batch-processing run removed 95% of points falling on vegetation. The algorithm also removed the points that fell on the edge of hard features such as structures, elevated roadways and bridges. 6. The operator interactively processed the data using lidar editing tools. During this final phase the operator generated a TIN based on a desired thematic layers to evaluate the automated classification

performed in step 5. This allowed the operator to quickly re-classify points from one layer to another and recreate the TIN surface to see the effects of edits. Geo-referenced images were toggled on or off to aid the operator in identifying problem areas. The data was also examined with an automated profiling tool to aid the operator in the reclassification. 7. The final bare earth was written to an LAS 1.0 format and also converted to ASCII. 8. The point cloud data were delivered in LAS 1. 0 format.
- 2006-12-18 00:00:00 - EarthData utilizes a combination of proprietary and COTS processes to generate intensity images from the lidar data. Intensity images are generated from the full points cloud (minus noise points) and the pixel width is typically matched to the post spacing of the lidar data to achieve the best resolution. The following steps are used to 1. Lidar point cloud is tiled to the deliverable tile layout. 2. All noise points, spikes, and wells are deleted out of the tiles. 3. An EarthData proprietary piece of software, EEBN2TIF is then used to process out the intensity values of the lidar. At this point, the pixel size is selected based on best fit or to match the client specification if noted in the SOW. 4. The software then generates TIF and TFW files for each tile. 5. ArcView is used to review and QC the tiles before delivery. 6. The lidar intensity data were delivered in TIF format.
- 2007-01-04 00:00:00 - It should be noted that the breaklines developed for use in the H&H modeling should not be confused with traditional stereo-graphic or field survey derived breaklines. The elevation component of the 3D streamlines (breaklines) is derived from the lowest adjacent bare earth lidar point and adjusted to ensure that the streams flow downstream. The best elevation that can be derived for the 3D streamlines will be the water surface elevation on the date that the lidar data was acquired. The elevations in the 3D streamlines will not represent the underwater elevations for streams due to the fact that lidar data cannot collect bathymetry information. Watershed Concepts and EarthData have done considerable research generating breaklines from lidar data. Current H&H modeling practices rely heavily on mass points and breaklines to create a realistic TIN surface for hydrologic and hydraulic modeling. Lidar data consists only of points, which are not suited to defining sharp breaks on terrain. The problem is most pronounced across stream channels, where lidar is not able to define the stream banks clearly. Furthermore lidar does not reflect off water; therefore, no reliable elevation points will exist within the stream channel itself. The TIN surface generated from lidar data alone is unsuitable for H&H modeling. Watershed Concepts engineers have studied the sensitivity of the 100-year flood boundary to the definition of stream channel geometry. The surface created with both lidar points and breaklines improves channel definitions for hydraulic cross section takeoffs and better defines the stream invert. It is not necessary to create breaklines on the top and bottom of stream banks; minor modifications to the cross sections and stream inverts can be made based on field survey data as necessary. In the 100-year flood, most of the flooded cross sectional area occurs in the overbank; therefore, creating a more refined channel definition from the lidar data is not cost effective. The lidar TIN is used simply as the basis for the overbank definition. Our

research indicates that breaklines are required at the stream centerline for smaller streams with widths less than 50 feet. For larger streams (widths greater than 50 feet, breaklines are needed on the left and right water edge lines. Collection of photography and stereo compilation of the breaklines is not cost-effective for this purpose. Watershed Concepts and EarthData have developed techniques to synthesize 3D breaklines using digital orthophotos and lidar data. These breaklines can be digitized in 2D from orthophotos, approximating the stream bank in areas of significant tree overhang. A bounding polygon, created from the edge of bank lines, is used to remove all points within the channel. Automatic processes assign elevations to the vertices of the centerline based on surrounding lidar points. The lines are then smoothed to ensure a continuous downhill flow. Edge-of-bank vertices are adjusted vertically to match the stream centerline vertices. A new TIN can then be created from the remaining lidar points and newly created breaklines. The new TIN clearly defines the stream channel. For this project, breaklines were generated in the matter described above for all streams draining greater than approximately one square mile. 2D lines defining the centerline and banks of those streams were manually digitized into ESRI shape file format from 2005 imagery. The streamlines were then processed against the bare earth lidar as described above. The new 3D lines were then viewed in profile to correct any anomalous vertices or remove errant points from the lidar DTM, which cause unrealistic " spikes" or "dips" in the breakline. The 3D breaklines were delivered in ESRI shapefile format.
- 2013-09-19 00:00:00 - The NOAA Office for Coastal Management (OCM) received the files in las format. The files contained LiDAR elevation and intensity measurements. The data were in Mississippi State Plane West (2301, feet) coordinates and NAVD88 (Geoid03) vertical datum (feet). OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. The data were converted from State Plane (2301) coordinates to geographic coordinates. 2. The data were converted from NAVD88 (orthometric) heights to GRS80 (ellipsoid) heights using Geoid03. 3. 8 laz tiles had coordinates falling outside of the header boundary. These tiles were re-tiled to remove any data points falling outside of the header boundary. 4. All laz tiles were received with all points classed as Class 1 (unclassified); the laz tiles were put through lasground.exe (lastools) which uses an algorithm to define which points fall as class 2 (Ground). 5. The data were sorted by time and zipped to laz format.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:
- 1.6. Type(s) of data
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

https://www.fisheries.noaa.gov/inport/item/49817

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides

information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
NOAA Office for Coastal Management (NOAA/OCM)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=2562
https://coast.noaa.gov/htdata/lidar1_z/geoid12a/data/2562

7.3. Data access methods or services offered:
This data can be obtained on-line at the following URL:

https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=2562

This data set is dynamically generated based on user-specified parameters.

;

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection
The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Office for Coastal Management - Charleston, SC

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.